



Kathleen Sebelius, Governor  
Roderick L. Bremby, Secretary

DEPARTMENT OF HEALTH  
AND ENVIRONMENT

[www.kdheks.gov](http://www.kdheks.gov)

Division of Environment

## AIR EMISSION SOURCE CONSTRUCTION PERMIT

**Source ID No.:** 1490001

**Effective Date:** February 29, 2008 (Amended May 7, 2008)

**Source Name:** Westar Energy, Inc. - Jeffrey Energy Center

**NAICS:** 221112, Fossil fuel power generation

**Site Location:** 25905 Jeffrey Road  
St. Mary's, Kansas 66536

**Site Owner/Operator Name:** Westar Energy, Inc.

**Site Owner's/Operator's  
Mailing Address:** 818 South Kansas Avenue  
Topeka, Kansas 66612

**Contact Person for Site Owner/  
Operator:** Mr. Daniel R. Wilkus, P.E. – Manager, Air Programs  
Telephone Number (785) 575-1614

**This permit is issued pursuant to K.S.A. 65-3008 as amended.**

### **Description of Activity Subject to Air Pollution Control Regulations**

Westar Energy, Inc. (Westar) is proposing to initiate an emission reduction project at its Jeffrey Energy Center (JEC) to add/rebuild air pollution controls, improve plant efficiency, and supply steam energy to a new, separately-owned, ethanol plant. The ethanol plant will be an independent facility near JEC, under different management and control, which will benefit from the process stream generated at JEC.

DIVISION OF ENVIRONMENT  
Bureau of Air & Radiation  
Air Permitting Section

CURTIS STATE OFFICE BUILDING, 1000 SW JACKSON ST., STE. 310, TOPEKA, KS 66612-1366

Voice 785-296-1570 Fax 785-291-3953

Increased utilization of the boilers may be realized through the following project elements: steam extraction for the ethanol plant and anti-slagging chemical (downtime reduction). Improved steam turbine efficiency may increase heat input to the boilers.

Since the proposed modification will be a major modification of a major stationary source for at least one regulated pollutant emitted in excess of the PSD significant emission levels, it will be subject to the requirements of 40 CFR 52.21, Prevention of Significant Deterioration (PSD), as adopted under K.A.R. 28-19-350. JEC1, JEC2, and JEC3 are affected sources subject to Title IV of the Federal Clean Air Act, Acid Deposition Control. The proposed project does not constitute a modification or reconstruction for the purpose of determining applicability of New Source Performance Standard (NSPS) requirements.

Emissions of oxides of nitrogen (NO<sub>x</sub>), volatile organic compounds (VOC), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), and carbon monoxide (CO) were evaluated for this permit review. This project is subject to the provision of K.A.R. 28-19-300 (Construction permits and approvals; applicability) because the projected increase in CO emissions due to the project exceeds 100 tons per year.

An air dispersion modeling impact analysis, an additional impact analysis, and a Best Available Control Technology (BACT) determination were conducted as a part of the construction permit application process.

### **Significant Applicable Air Pollution Control Regulations**

The following significant Kansas air quality regulations were determined to be applicable to this project:

K.A.R. 28-19-300. Construction permits and approvals; applicability

K.A.R. 28-19-350. Prevention of significant deterioration of air quality

### **Air Emission Unit Technical Specifications**

The following equipment or equivalent is approved:

1. Add steam extraction from steam turbines to support ethanol plant
  - Extraction from each of the three JEC steam turbines, and
  - Maximum design extraction is 330,000 lb/hr total for all three combined
2. Improve steam turbine efficiency and increase electrical output
  - New high pressure (HP), intermediate pressure (IP), and low pressure (LP) rotors and inner casings
  - Heat input capacity for each boiler following steam turbine improvements is expected to be 8262 MMBtu/hr

3. Addition of anti-slagging additive to each of the three JEC boilers
4. Boiler efficiency improvements
  - Reheater surface area adjustment
  - Superheater platen membrane tip changes
  - Boiler air and gas path flow improvements
5. Rebuild of scrubbers<sup>1</sup>
  - Rebuild existing wet limestone scrubber on each of the three boiler units
  - Add limestone handling and gypsum/landfill handling
6. ESP upgrades
  - Replace existing collection plates and discharge electrodes
7. Addition of Low NO<sub>x</sub> burners and separated over-fire air (SOFA) to JEC1 and JEC2, and tuning of all three boilers<sup>2</sup>.

---

<sup>1</sup> KDHE issued an Air Construction Approval on March 28, 2007 for the portions of this project that were determined to have an increase in a regulated pollutant.

<sup>2</sup> KDHE issued an Air Construction Permit on October 4, 2005 for the addition of Low NO<sub>x</sub> burners and SOFA to JEC3.

## Air Emissions Estimates from the Proposed Activity

Project Emissions (tons/year)					
Pollutant	Baseline Emissions	Projected Actual Emissions <sup>1</sup>	Estimated Emissions Change	Significant Emission Increase (SEI)	Baseline Emissions Plus SEI <sup>7</sup>
Nitrogen Oxides (NO <sub>x</sub> )	30,723 <sup>2</sup>	13,283	-17,440	40	30,763
Volatile Organic Compounds (VOC)	289 <sup>3</sup>	317	28	40	329
Particulate Matter less than 10 microns (PM <sub>10</sub> ) <sup>6</sup>	2,005 <sup>4</sup>	1,851	-154	15	2,020
Particulate Matter (PM) <sup>6</sup>	3,102 <sup>4</sup>	2,918	-184	25	3,127
Sulfur Dioxide (SO <sub>2</sub> )	67,362 <sup>2</sup>	13,283	-54,079	40	67,402
Carbon Monoxide (CO)	2,412 <sup>3</sup>	22,138 <sup>5</sup>	19,726 <sup>5</sup>		

1. These Projected Actual Emissions are not enforceable permit limits or conditions. They are projections used to determine PSD applicability. They do not include any increase in emissions that could have been accommodated during the baseline period and is attributable to an increase in projected capacity utilization at the facility that is unrelated to this modification, including any increased utilization due to the rate of electricity demand growth for the utility system as a whole. See 40 CFR 52.21(b)(41).

2. Acid Rain CEM data used to determine baseline emissions.

3. AP-42 emission factors used to determine baseline emissions; section 1.1 dated 9/98 and section 1.3 dated 9/98.

4. Results of stack tests conducted 3/02 and 4/02 used to determine baseline emissions.

5. Emission estimates are based on new emission limits for JEC1 and JEC2, and existing emission limit on JEC3.

6. Filterable particulate matter portion only.

7. Actual emissions (minus emissions that could have been accommodated during the baseline period and are due to demand growth) should be compared to this number, which should not be exceeded when reporting under Monitoring, Recordkeeping and Reporting item 5.

## Air Emission Limitations

### Coal-fired Boilers JEC1 and JEC2:

1. The thirty (30) day rolling average emission rate of carbon monoxide (CO) emissions from each boiler unit shall not exceed 0.25 lb/mmBtu, excluding periods of startup, shutdown, and malfunction.

2. The purpose of this project is to reduce the NO<sub>x</sub> emissions from each boiler unit. In the event difficulties are encountered demonstrating compliance with the CO limit while optimizing NO<sub>x</sub> emissions, the owner or operator may request a revision to the CO limit.

### **Permit Conditions**

Prior to commencing operation of items 1, 2, or 3 under the "Air Emission Unit Technical Specifications" section, the owner or operator shall install and commence operating low NO<sub>x</sub> burners and SOFA on either JEC Unit 1 or JEC Unit 2, and will rebuild and commence operating a wet limestone scrubber on JEC Unit 1, JEC Unit 2 or JEC Unit 3.


### **Monitoring, Recordkeeping and Reporting**

1. Compliance with the CO BACT limit shall be demonstrated with a continuous emission monitoring system (CEMS). The CO CEMS shall be installed, certified, operated, maintained, and quality assured according to 40 CFR 60, Appendix B, Performance Specification 4 (PS4) and 40 CFR 60, Appendix F (Quality Assurance/Quality Control) within 180 days after startup.
2. Provide a report of the CO CEMS certification within 30 days after certification is completed.
3. Reports of excess emissions shall be submitted semi-annually in accordance with the requirements in 60.7(c). The summary report referenced in 60.7(c) and defined in 60.7(d) applies to the CO CEMS downtime only and is not applicable to an exceedance of the CO limit established in this document.
4. CO Records shall be kept on site for 2 years in accordance with 60.7(f).
5. In accordance with 40 CFR 52.21(r)(6)(iii):  
Monitor, calculate, and maintain a record of the annual emissions of NO<sub>x</sub>, VOC, PM<sub>10</sub>, PM and SO<sub>2</sub>, in tons per year on a calendar year basis, for a period of 10 years following resumption of regular operations after the change.
6. In accordance with 40 CFR 52.21(r)(6)(iv):  
Submit a report to KDHE within 60 days after the end of each calendar year during which records must be generated under paragraph (r)(6)(iii) of 40 CFR 52.21 setting out the unit's annual emissions.

## **General Provisions**

1. This document shall become void if installation of this Project has not commenced within 18 months of the effective date of this permit, or if installation is interrupted for a period of 18 months or longer.
2. A construction permit or approval must be issued by KDHE prior to commencing any construction or modification of equipment or processes which result in an increase in potential-to-emit equal to or greater than the thresholds specified at K.A.R. 28-19-300.
3. Upon presentation of credentials and other documents as may be required by law, the permittee shall allow a representative of the KDHE (including authorized contractors of the KDHE) to:
  - (a) enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under conditions of this document;
  - (b) have access to and copy, at reasonable times, any records that must be kept under conditions of this document;
  - (c) inspect at reasonable times, any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this document; and
  - (d) sample or monitor, at reasonable times, for the purposes of assuring compliance with this document or as otherwise authorized by the Secretary of the KDHE, any substances or parameters at any location.
4. The emission unit or stationary source which is the subject of this document shall be operated in compliance with all applicable requirements of the Kansas Air Quality Act and the Federal Clean Air Act.
5. This document does not relieve the permittee of the obligation to obtain other approvals, permits, licenses or documents of sanction which may be required by other federal, state or local government agencies.
6. Issuance of this document does not relieve the owner or operator of any requirement to obtain an air quality operating permit under any applicable provision of K.A.R. 28-19-500.

**Permit Engineer**

  
\_\_\_\_\_  
Jason Heitman  
Engineering Associate  
Air Permitting Section

5-7-2008  
Date Signed

JTH:saw  
c: NEDO  
C-7839